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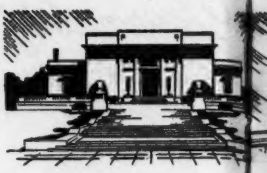
COVER: Propylene Glycol is now going into National Formulary products for the first time as a replacement for Glycerin. Made official because of the uncertain Glycerin supply, this clear, colorless solvent may find a place in the pharmacist's armamentarium even in peacetime. The new monograph for Propylene Glycol and a list of permissive replacements for which it can be used are included in the Third N.F. Supplement. A copy can be obtained by sending a large self-addressed, stamped envelope to Justin L. Powers, Chairman of Committee on National Formulary, 2215 Constitution Avenue, Washington 7, D. C.



The Way I

VENEREAL DISEASE. Not so long ago these words in print would have raised the eyebrows of Dame Grundies everywhere. Now they are headlined in the best newspapers and heard in polite drawing rooms—thanks to the venereal disease campaign conducted by the U. S. Public Health Service, American Social Hygiene Association and physicians, pharmacists and other public health workers. Illuminating with the glare of publicity the inroads that venereal disease has made on the nation's health was the first great step toward VD control. In this the pharmacist played a commendable part. He is destined to play a greater role.

A new year in the campaign is marked by Social Hygiene Day (see page 15), set aside to emphasize how venereal disease can sabotage the war effort by wasting manpower and how it can be prevented and controlled. Although pharmacy window displays and the distribution of literature ties in with the observance of Social Hygiene Day, alert pharmacists have been taking advantage of this opportunity throughout the year to demonstrate the role they can play in such public health programs. Work that helps to reduce venereal disease indirectly helps to establish the pharmacy as a community health center and again demontrates its importance as the most practical outlet for the dissemination of public health information.

The job to be done in 1944 is emphasized by the fact that of the first 2,000,000 men called for examination by Selective Service, no less than 45.3 per thousand were found to be infected with syphilis. As long as the factors which produce this blight on the nation's youth exist, the use of prophylactic measures will continue to be widespread. Since under present conditions prophylactics *are* going to be distributed, there seems to be little point in opposing the distribution of reliable products and information through the one practical public health outlet, the pharmacy. It is at this point of contact that the pharmacist—by a judicious word to a neighborhood friend, by literature obtained from the local health department or American Social Hygiene Association—can do much toward controlling the spread of venereal diseases.

If a person already has been infected, the pharmacist, as the most convenient health counselor, is often the first to be consulted for help. What pharmacist has not faced this responsibility as an embarrassed youth sidles up to the dispensing counter? There can be insufficient advice and neglect, inadequate treatment and regret, or helpful direction and successful therapy. Most pharmacists now choose the latter, supplying a list of competent physicians and reliable clinics and making a positive effort to assure that treatment is promptly started. Surveys show that widespread counter prescribing of antivenereal nostrums belongs to a best-forgotten era of the past.

The great strides that have been made in VD therapy during the past couple of years promise to eliminate the discouragingly long series of treatments formerly necessary. It may well mark the death knell of venereal disease as a major blight on the country's health. Trials of the so-called one-day treatment combining artificial fever and massive doses of arsenicals and bismuth indicate that the method will be effective against early contagious syphilis. Modifications seem certain to make the method safer and still more successful. Recent animal experiments raise the hope that chalcone, a chemical isolated from lemon peel, may help to overcome the toxic reactions sometimes produced by mapharsen, the arsenical of choice in the rapid treatment.

To keep pharmacists informed on the

Looks To Us

new developments and on how pharmacists can help promote the social hygiene program, the Joint Committee of the AMERICAN PHARMACEUTICAL ASSOCIATION and the American Social Hygiene Association is planing further extension of its work.

AMONG the wartime developments in pharmacy that were acted upon by the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION at its December meeting in Washington was the approval of a Subcommittee on Pharmacy in the National Research Council. Set up as a part of the Division of Medical Sciences, the subcommittee is expected to serve the NRC permanently in an advisory capacity on the many professional and technical problems which arise relating to pharmacy. As a first project the pharmacy subcommittee has been asked to review the War Department's manual for pharmacy technicians with an eye toward possible revision of its content. If the work of the NRC subcommittee develops as expected, it should go far toward promoting a more complete utilization of pharmaceutical resources and coördinating the profession's services with the other medical sciences.

The further extension of professional relations was discussed in connection with another conference which is being planned between the American Medical Association and the AMERICAN PHARMACEUTICAL ASSOCIATION. Both associations have expressed the hope that the work of the first historic joint meeting held in 1942 could be continued to study mutual problems and develop greater coöperation between the two professions.

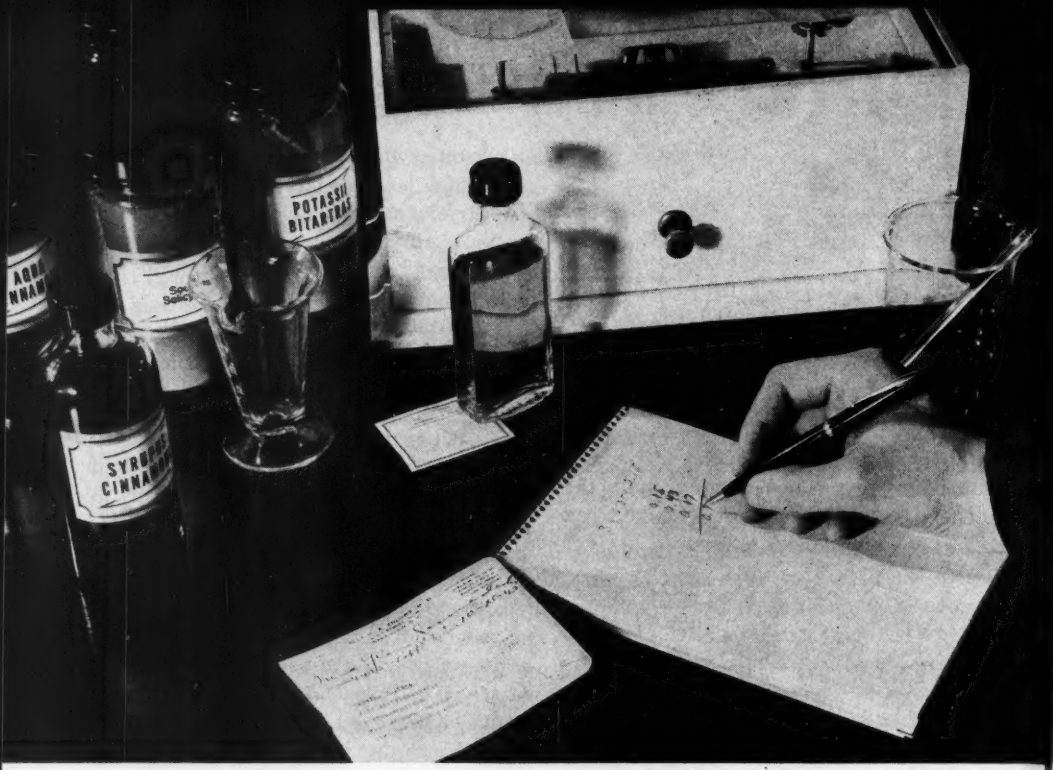
One of the problems affecting both medicine and pharmacy discussed at the A. PH. A. Council meeting was the proposed changes in the form of administering medical care. It was felt that the Wagner-Murray-Dingell bill now in Congress has inherent defects and delegates unnecessarily arbitrary powers to those who would administer the medical benefits under an extended social security system. The Council therefore went on record as being "opposed to the attempted regimentation of medical practices and other health services and any autocratic principles contained in Title 9" of the bill, which is the section relating to medical benefits.

There are other indications that the future may hold many changes for pharmacy, as well as other fields of endeavor. To help cope with the problems before us, the Council decided to sponsor another meeting of the state secretaries and other state association officials. Provided that war conditions permit, the meeting will be called in the spring of 1944.

Plans for the next meeting of the national association were also discussed and a tentative decision made to hold the convention at some central location in July, August or September. A streamlined meeting following last year's pattern is expected, except that at least one session of the ASSOCIATION Sections will be provided for.

That A. PH. A. continues to grow in strength as well as in achievements was indicated by the membership chairman who reported that more than 2500 new members were accepted last year, 35.5% of them being retail pharmacists.

Activities of the various other committees were reported, and their progress on individual projects in behalf of the nation's pharmacists will be published in coming issues of the JOURNAL.



Survey of

CURRENT PRESCRIPTION PRICING

by KARL J. GOLDNER[1] and WALTER G. FREDELL[2]

WIDE VARIATION STILL EXISTS IN PRICING OF PRESCRIPTIONS, ANALYSIS OF SURVEY REVEALS

BECAUSE great variation existed in the pricing of prescriptions, some ten or more pricing schedules have been introduced and popularized in the past two decades. While we know vaguely that some variation still exists, it was thought advisable to collect specific data and determine statistically the characteristics of present-day prescription prices. Accordingly, 14 prescriptions were selected, illustrating the types most commonly encountered. These were priced by 220 retail, professional and hospital pharmacists. About one-fifth of these were from St. Louis, one-fifth from Memphis, one-fifth from the state of Kansas, and the remainder scattered throughout the United States. The form shown on the next page was used to collect the data.

EDITOR'S NOTE: Before studying the analysis of results of the survey, fill out the form on the opposite page according to your own pricing method. Then turn to the tables and graphs and compare your prescription fees to those of fellow pharmacists. Note the wide variations. The authors have presented their data in varied form to emphasize the lack of agreement in pricing which still seems to exist.

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ACKNOWLEDGMENT: The authors wish to acknowledge the coöperation of the following in obtaining data reported in this paper: Dean Robert L. Crowe, Univ. of Tenn.; Dean Elmer Hammond, Univ. of Miss.; Dr. Edward R. Brecht, Univ. of N. C.; Dr. Kenneth Redman, Univ. of Toledo; Dr. Allen I. White, Wash. State College; Dr. Curtis Waldon, Univ. of Mont.; and Dr. Roy A. Bowers, Univ. of Kansas.

PRESCRIPTION PRICING SURVEY

Directions: The following prescriptions are common to most parts of the U. S. You are asked to calculate the selling price of each of these prescriptions as you would in your own store and record your calculated selling price over the corresponding number and in the space provided at the bottom of this sheet. For your convenience the cost of each prescription is recorded and underscored under each prescription number and is based on the cost of the smallest amount or quantity of the item that can be purchased. The cost, therefore, is a maximum cost. If your purchase of these items in larger quantities affects your selling price, please use your own cost figures and forget the costs that are here entered.

In addition, check one of the squares at the bottom of this sheet indicating the type of pharmacy in which you practice your profession; *R* represents a Retail Drug Store, *P* a Professional Pharmacy and *H* a Hospital Pharmacy.

Do not sign your name. Tear off the bottom of this sheet at the line indicated and turn in to the one presenting this sheet.

Rx 1. Codeine Sulfate.....gr. iii
59c Cheracol.....oz. iv
Sig. Dr. i t.i.d. for cough.

Rx 2. Elixir Alurate.....oz. iv
72c Sig. Dr. i q.i.d.

Rx 3. Sodium Salicylate,
18c Pot. Bicarbonate, *aa*..... 10
Cinnamon Water..... 60
Syr. Cinnamon, *q. s. ad*..... 120
Sig. Dr. i *qh* 2 p.r.n.

Rx 4. White Lotion N. F..... 120
8c Sig. Apply locally.

Rx 5. Tabs. Sod. Salicylate.....gr. x
10c No. xii
Sig. One a.m. and p.m.

Rx 6. Caps. Nembutal.....gr. iss
44c No. xii
Sig. One or two at night.

Rx 7. Tabs. Thyroid.....gr. 1/4
28c Disp. No. C.
Sig. One t.i.d.

Rx 8. Caps. Combex, No. C.
$3.11 Sig. 2 Caps. t.i.d.

Rx 9. Acid Acetylsal.....gr. iv
14c Phenacetin.....gr. ii
Caffeine.....gr. 1/2
M. ft. Caps. tales No. xxxvi
Sig. One every 3 hours.

Rx 10. Salicylic Acid..... 1
11c Precip. Sulfur..... 3
Petrolatum, *q. s. ad*..... 30
M. ft. ung.
Sig. Apply locally.

Rx 11. Efferv. Sodium Phosphate.....oz. iv
33c Sig. Dr. i in water a.c.

Rx 12. Ephedrine Sulfate..... 0.3
7c Normal Saline, *q. s. ad*..... 30.
Sig. Gtt. iii in nostrils t.i.d.

Rx 13. Calcium Carbonate..... 125
24c Sodium Bicarbonate..... 375
M. et Sig. Dr. i in water p.c.

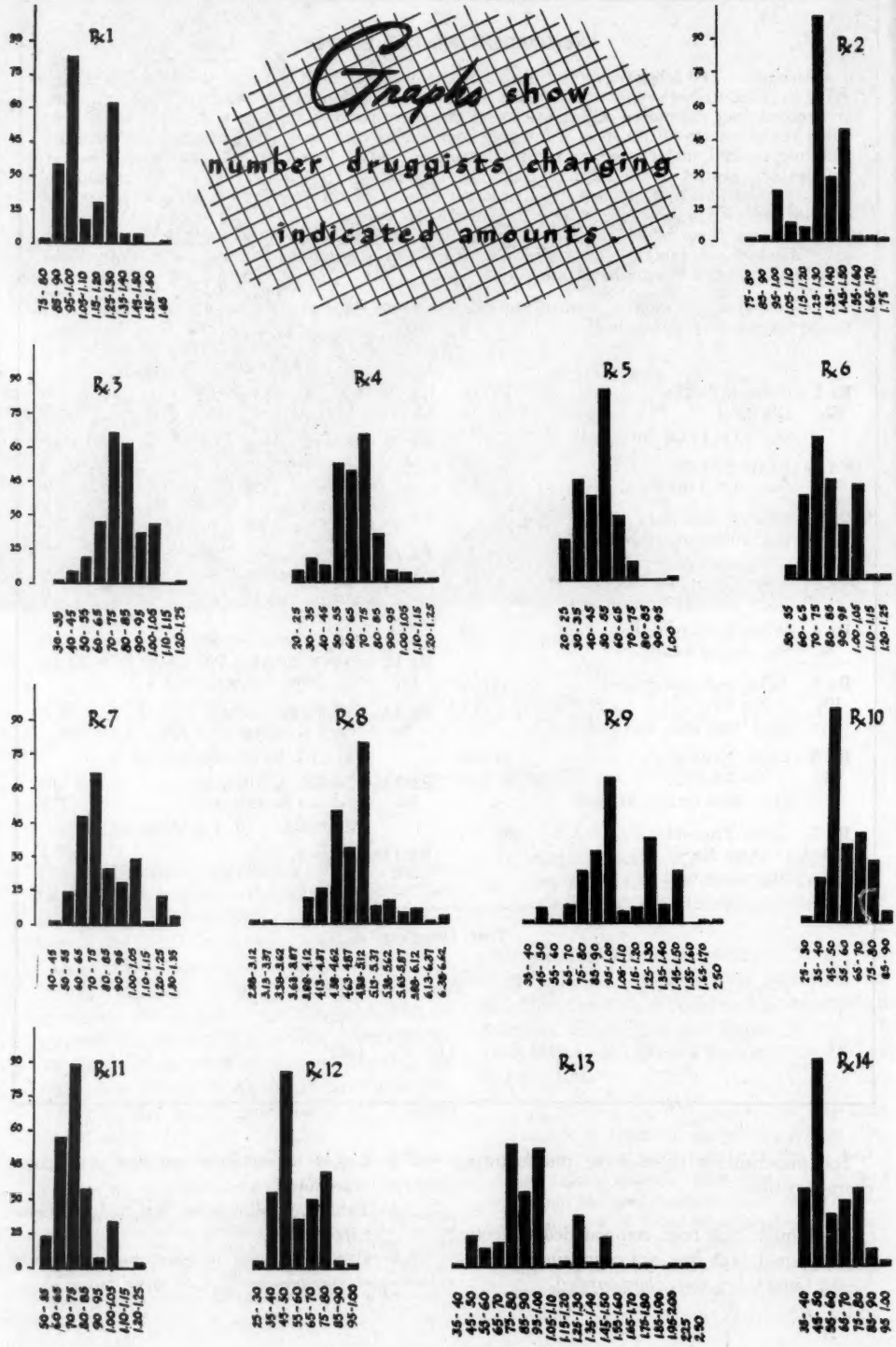
Rx 14. Argyrol, 10%.....oz. i
20c Sig. Drop in eyes as directed.

Tear Off Here

R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
P							
H	(8)	(9)	(10)	(11)	(12)	(13)	(14)

The prescriptions listed have the following characteristics:

1—Liquid, high cost, compounded, narcotic.
2—Liquid, high cost, not compounded.
3—Liquid, low cost, compounded.
4—Liquid for external use, low cost, compounded.
5—Tablets, small number, low cost, not compounded.
6—Capsules, small number, high cost, not compounded.


Rx1
Rx2
Graphs show number druggists charging indicated amounts.
Rx3
Rx4
Rx5
Rx6
Rx7
Rx8
Rx9
Rx10
Rx11
Rx12
Rx13
Rx14

7—Tablets, large number, low cost, not compounded.
8—Capsules, large number, high cost, not compounded.
9—Capsules, large number, low cost, compounded.
10—Ointment, low cost, compounded.
11—Effervescent salt, not compounded, requiring only the substitution of the prescription label for the original label.
12—Liquid, used in drop dose, low cost.
13—Bulk powder, large quantity, low cost, compounded.
14—Eye drops, somewhat higher cost than No. 12, frequently dispensed "over the counter."

TABLE I—PERCENTAGE OF DRUGGISTS AND PRICES CHARGED

Price	*Rx 1*	*Rx 2*	*Rx 3*	*Rx 4*	*Rx 5*	*Rx 6*	*Rx 7**	*Rx 9*	*Rx 10*	*Rx 11*	*Rx 12*	*Rx 13*	*Rx 14*
$2.50	..	..	..	..	..	..	..	0.5	..	..	..	0.5	..
2.25	..	..	..	..	..	..	..	..	..	..	..	0.5	..
2.00	..	..	..	..	..	..	..	..	..	..	..	0.5	..
1.75	..	0.5	..	..	..	..	..	..	..	..	..	0.5	..
1.70	..	..	..	..	..	..	..	..	..	..	..	..	..
1.65	0.5	0.9	..	..	..	..	..	0.5	..	..	..	0.5	..
1.60	..	0.9	..	..	..	..	..	..	..	..	..	0.5	..
1.55	..	..	..	..	..	..	..	..	..	..	..	..	..
1.50	0.9	18.6	..	..	..	..	..	10.5	..	..	..	5.9	..
1.45	0.9	3.6	..	..	..	..	..	..	..	..	..	..	..
1.40	..	1.8	..	..	..	..	..	0.5	..	..	..	..	..
1.35	1.8	10.9	..	..	..	..	1.4	3.2	..	..	..	0.9	..
1.30	..	9.1	..	..	..	..	..	0.5	..	..	..	..	..
1.25	28.2	35.9	..	..	..	0.5	5.4	16.8	..	0.9	..	10.5	..
1.20	0.9	0.5	0.5	0.5	..	0.5	..	2.3	..	..	..	..	..
1.15	7.3	2.3	..	..	..	0.5	0.5	0.9	..	..	..	0.9	..
1.10	4.1	2.7	..	0.5	..	0.5	..	1.4	..	..	..	0.5	..
1.05	0.9	0.9	..	..	..	..	..	0.9	..	..	..	..	..
1.00	36.4	10.0	11.8	1.8	0.5	19.1	15.4	27.7	..	9.1	0.5	21.8	0.9
0.95	1.4	..	1.4	..	..	3.2	0.5	1.4	..	0.5	0.5	1.8	..
0.90	8.6	0.5	8.6	2.3	..	7.7	7.7	5.4	0.5	1.4	..	6.4	0.5
0.85	7.3	0.5	26.8	9.1	..	18.2	10.9	9.1	1.8	15.0	1.4	8.6	2.7
0.80	..	..	0.9	0.5	..	1.8	..	..	..	0.5	0.5	..	..
0.75	0.9	0.5	30.0	29.6	3.2	27.3	30.0	10.5	12.3	40.0	18.6	24.5	15.4
0.70	..	..	..	..	0.5	1.4	..	0.5	0.5	0.5	0.5	0.5	..
0.65	..	..	8.6	16.4	5.9	8.6	14.5	3.2	17.3	15.9	13.2	4.5	13.2
0.60	..	..	3.6	5.9	6.8	8.2	6.8	0.9	15.0	10.	9.6	3.6	9.6
0.55	..	..	..	..	..	..	..	..	0.5	1.4	..	..	0.9
0.50	..	..	5.0	23.6	38.2	2.7	6.4	2.7	40.5	5.0	35.4	5.9	35.0
0.45	..	..	1.4	0.5	4.1	..	..	0.5	1.8	..	3.6	0.5	6.4
0.40	..	..	0.9	2.7	12.7	..	0.5	..	2.7	..	3.6	..	5.9
0.35	..	..	..	4.1	17.7	..	..	0.5	5.9	..	11.4	0.5	9.6
0.30	..	..	0.5	0.5	2.3	..	..	..	..	..	..	..	..
0.25	..	..	..	1.8	7.3	..	..	..	0.9	..	1.4	..	..
0.20	..	..	..	0.5	0.9	..	..	..	..	..	..	..	..

* *Rx 8*

$6.38–6.62	1.4	$5.13–5.37	3.2	$3.88–4.12	5.0
6.13–6.37	0.5	4.88–5.12	35.9	3.63–3.87	..
5.88–6.12	2.7	4.63–4.87	15.0	3.38–3.62	..
5.63–5.87	1.8	4.38–4.62	22.3	3.13–3.37	0.5
5.38–5.62	4.5	4.13–4.37	6.8	2.88–3.12	0.5

TABLE II—CHARACTERISTICS OF PRICES CHARGED

	Rx 1	*Rx 2*	*Rx 3*	*Rx 4*	*Rx 5*	*Rx 6*	*Rx 7*	*Rx 8*	*Rx 9*	*Rx 10*	*Rx 11*	*Rx 12*	*Rx 13*	*Rx 14*
Mean	1.08	1.29	0.79	0.65	0.51	0.81	0.81	4.83	1.05	0.57	0.75	0.56	0.94	0.56
Median	1.00	1.25	0.75	0.65	0.50	0.80	0.75	4.86	1.00	0.50	0.75	0.50	0.90	0.50
Mode	1.00	1.25	0.75	0.75	0.50	0.75	0.75	5.00	1.00	0.50	0.75	0.50	0.75	0.50
High	1.65	1.75	1.20	1.20	1.00	1.25	1.35	6.50	2.50	0.90	1.25	1.00	2.25	1.00
Low	0.75	0.75	0.30	0.20	0.20	0.50	0.40	3.00	0.35	0.25	0.50	0.25	0.35	0.35
Range	0.90	1.00	0.90	1.00	0.80	0.75	0.95	3.50	2.15	0.65	0.75	0.75	1.90	0.65
Mean deviation	0.14	0.12	0.11	0.13	0.10	0.11	0.15	0.37	0.22	0.10	0.09	0.12	0.22	0.12

TABLE III—PERCENTAGE OF DRUGGISTS AND PRICES CHARGED

Rx 1
96.0% charged $1.25 or less
81.9% charged $1.00 or more
77.8% charged between $1.00 and $1.25

Rx 2
97.7% charged $1.50 or less
82.2% charged $1.25 or more
79.9% charged between $1.25 and $1.50

Rx 3
99.5% charged $1.00 or less
80.0% charged 75c or more
79.5% charged between 75c and $1.00

Rx 4
85.6% charged 75c or less
90.2% charged 50c or more
75.5% charged between 50c and 75c

Rx 5
83.2% charged 50c or less
89.5% charged 35c or more
72.7% charged between 35c and 50c

Rx 6
98.0% charged $1.00 or less
79.3% charged 75c or more
77.3% charged between 75 and $1.00

Rx 7
92.3% charged $1.00 or less
71.8% charged 75c or more
64.5% charged between 75c and $1.00

Rx 8
86.0% charged $5.00 or less
87.3% charged $4.50 or more
73.2% charged between $4.50 and $5.00

Rx 9
18.8% charged 75c or less
(great variation in pricing)

Rx 10
97.7% charged 75c or less
88.7% charged 50c or more
86.1% charged between 50c and 75c

Rx 11
88.1% charged 85c or less
83.6% charged 65c or more
71.9% charged between 65c and 85c

Rx 12
97.1% charged 75c or less
80.2% charged 50c or more
77.3% charged between 50c and 75c

Rx 13
63.2% charged between 75c and $1.00
(great variation in pricing)

Rx 14
95.9% charged 75c or less
78.2% charged 50c or more
74.1% charged between 50c and 75c
21.9% charged less than 50c

In the case of all the prescriptions, the range was great. This figure is, however, not so significant as the mean deviation. This was exceptionally high with prescriptions No. 8, No. 9 and No. 13.

The graphs shown did not conform to normal distribution but showed several peaks. These peaks occurred most often at what might be considered "round numbers," such as, 0.75, $1.00, and $1.25. Figures such as $1.05 occurred only rarely. Only two pharmacists used odd figures in pricing the prescriptions. Because the *distribution was not normal*, the differences in prices between cities and country towns and between different sections of the country were not considered significant.

Further Studies Made

The coefficient of correlation is spuriously high if prescription No. 8 is included. Omitting this from the data, a correlation coefficient (r) of 0.88 is obtained for the correlation between the cost of materials and the modal selling price.

Further studies are being made to determine how closely the selling prices obtained by using the existing pricing schedules compare with the mean and mode obtained in the foregoing data.

CHICKENS MAY PROVIDE NEW SERIES OF VACCINES

A new line of vaccines and antiserums prepared from chicken blood may some day be prescription items for use against certain virus diseases. A chicken antiserum that protects mice against a virus pneumonia peculiar to these animals has been developed by Maurice R. Hilleman and Dr. F. B. Gordon of the University of Chicago (*Science*, 98: 347, 1943). This mouse pneumonia is caused by a virus definitely related to the viruses that cause parrot fever, lymphogranuloma venereum, meningopneumonitis, trachoma, inclusion conjunctivitis and some of the atypical pneumonias now prevalent.

So far, it has been impossible to produce vaccines or antiserums for these diseases by the usual methods. Inoculating the virus into roosters is apparently successful; at least a plentiful supply of mouse pneumonia virus antibodies is produced. The Chicago report states that it is "possible that such serums would prove of value in treatment of human infections with these agents." Further research toward this end is in progress.

INFLUENZA RESEARCH ADVANCES

AN EXAMINATION of the influx of prescriptions for influenza cases in many sections of the country emphasizes the lack of effective preventive or therapeutic treatment. Recent research summarized in a report from Science Service holds little promise of immediate aid, though scientists have developed three potential weapons against the disease.

A total of 26 powerful germ-fighters have been tried out as possible weapons against influenza and found wanting by the Naval Laboratory Research Unit No. 1 at the University of California.

"None of the compounds tested under the conditions of this experiment, alone or in combination, was effective in preventing influenzal infection in mice," Captain A. P. Krueger, officer-in-charge, and his associates reported.

Penicillin, the powerful germ-fighter from mold, other chemicals from microörganisms and the sulfa drugs were included in the 26 compounds tested.

Just as discouraging is the news that you can get influenza again within four months after having had an attack. This is shown by the experience of a group of human "guinea pigs" who were inoculated with living influenza virus by the nasal route twice in four months. The tests were reported by Dr. Thomas Francis, Jr., of the University of Michigan School of Public Health at the conference of American Public Health Association.

With the first dose of influenza virus, type B, most of the volunteers got sick with a mild but definite illness characteristic of influenza B. Their sickness was quite different from a cold, streptocococcus infection or mild pneumonia.

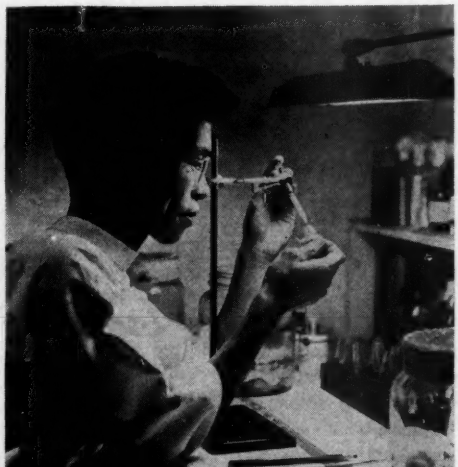
Four months later, when the volunteers were given the second dose of the same virus, they again got influenza. In general they were not quite so sick and had lower temperatures, but a definite proportion had just about the same kind of attack they had had only four months before.

From the standpoint of prevention of influenza, Dr. Francis pointed out, the experiments show that to be effective, anti-influenza measures must be able to create a sustained state of resistance greater than that which follows a single mild infection.

Latest hope for preventing influenza by a serum treatment comes from a method developed by the same Naval Laboratory Research Unit that found penicillin, sulfa drugs and the like ineffective. Inhalation of immune serum sprayed from an atomizer is the method these investigators believe might both ward off an attack and act as remedy.

Mice given inhalations of a globulin fraction of influenza-immune horse serum were protected against influenza, the degree of protection increasing with the duration of inhalation, the Naval researchers reported to the American Association of Immunologists. Treatment with the immune serum was effective when given as long as 48 hours after the mice got influenza. Repeated treatments 24 hours apart were significantly more effective than one treatment.

Inhalation, the scientists found, is a better method of giving the protective and remedial immune serum than dropping it up the nose. Experiments on monkeys and mice with India ink and with radioactive chromic phosphate as indicators showed that with inhalation the material is uniformly distributed and penetrates to the



INFLUENZA SERUM that shows promise of being an effective preventive has been developed by the Navy Laboratory Research Unit No. 1. Pharmacist's Mate second class William D. Won is shown testing the new serum on mice in this official Navy photo.

outermost air sacs of the lungs at the ends of the bronchial tree.

Danger of humans getting allergic reactions to the immune horse serum has been overcome or at least reduced by treating the serum with certain enzymes.

The serum has been given to normal humans but so far no data on its efficacy have been obtained. Wartime epidemics may provide opportunity for a trial of the method's value in the fight against influenza.

A potential new weapon for chemical warfare against influenza has been developed by Dr. O. H. Robertson, Dr. Theodore T. Puck, Dr. Henry F. Lemon and Dr. Clayton G. Loosli, of the University of Chicago's Department of Medicine.

Triethylene glycol is the new weapon. Two-tenths of a cubic centimeter vaporized in 800 cubic feet of air protected mice completely against an amount of air-borne influenza virus which a short time before had caused the death of all the exposed (control) mice. Similar small concentrations of triethylene glycol vapor in air are also deadly to pneumonia and streptococcus germs, the Chicago experimenters found. Tests on the possible poisonous effects of this chemical when swallowed, or when inhaled over a long period of time, are now under way.

Previously Dr. Robertson and associates had found that propylene glycol was an efficient destroyer of disease germs in the air and was relatively nonpoisonous to laboratory animals. Triethylene glycol, however, is so much more deadly to the germs that if it proves equally safe, it will be a better weapon to use in attempts to stop influenza epidemics by air sterilization.

A 50-watt light bulb, a 10-inch electric fan and about one and one-half pints of propylene glycol in a can or dish with a surface area of 18 square inches are said to be all that are needed for field studies of the possibilities of chemical war against influenza, pneumonia and other diseases that spread through the air. This new simplified field equipment was developed by the personnel of Naval Laboratory Research Unit No. 1.

The required concentration of the vapor in a small room of 2000 cubic feet, with five air turnovers per hour, can be achieved by the apparatus described. The light bulb is placed in the can or beaker of propylene glycol to heat and vaporize the chemical and the fan is placed one or two feet away so that it directs an air stream across the liquid surface.

Preventing the spread of influenza by continuous air disinfection is pretty much up to industry now, in the opinion of Dr. Stuart Mudd, of the University of Pennsylvania. This air disinfection, either by germicidal vapors or ultraviolet light, has reached the practical stage for small areas, he declared in a report to the American Public Health Association.

If it is going to be used in large places, industry, which will benefit so greatly in reduced absenteeism, must supply the financial and technical means necessary to reach the final stage of disinfecting the air in large rooms and buildings.

RED BLOOD CELL POWDER SPEEDS WOUND HEALING

Successful use of a blood powder from red blood cells, salvaged from plasma production, in speeding wound healing is reported by Dr. T. H. Seldon and Dr. H. H. Young of the Mayo Clinic.

The red blood cell powder is either dusted on the wound or applied with a sterile spatula. One or two applications are made daily and the wound covered after each with a dry, sterile dressing.

A five-inch-wide varicose ulcer, which almost encircled the patient's leg and had been present for eight years in spite of treatment by the usual accepted methods, was almost completely healed in eight weeks by daily application of the red blood cell powder.

The blood powder has also given good results in a number of wounds following surgical removal of pilonidal cysts and fistulas. Infected wounds, amputation stumps that were not healing, and open chest wounds are other types treated.

The results are not uniformly beneficial. In three cases the powder caused such severe, irritating, burning pain that it had to be discontinued. The Mayo Clinic doctors believe, however, that further study of the use of the red blood cell powder is warranted.

The use in wound treatment of red blood cells salvaged from plasma production was first suggested and tried by Dr. J. J. Moorhead and Dr. L. J. Unger, of New York City. These doctors used the cells in the form of a gelatin-like mass. Difficulty in keeping this semiliquid material from being absorbed by the dressing or running out of the wound led to development, by Dr. A. E. Osterberg of the Mayo Clinic, of the red blood cell powder.

PRESCRIPTION Information SERVICE

PROFESSIONAL PROBLEMS OF PHARMACISTS ANSWERED. BOARD OF 11 PHARMACEUTICAL SPECIALISTS AND A. PH. A. LIBRARY AND LABORATORY FACILITIES AVAILABLE TO OUR READERS. SEND QUERIES DIRECTLY TO PRACTICAL PHARMACY EDITION GIVING ALL PERTINENT INFORMATION

HANDLING OIL CHENOPODIUM

What is the correct method, step by step, for filling a prescription calling for Oil Chenopodium 0.15 cc., dispensed in two capsules?—W. R. K., Texas.

Measure the oil of chenopodium in a 1-cc. pipette graduated in tenths, or preferably hundredths. By using specific gravity the correct weight could also be calculated, and the oil then weighed in a tared vessel on a good prescription balance. About 10 grains of a relatively insoluble powder, such as lactose or kaolin, is used for adsorbing the oil. Mix the oil and powder well, divide, and place in gelatin capsules. An alternate, though perhaps less desirable, method would be to drop the oil itself directly into a small gelatin capsule. The inner rim of the capsule is then moistened with water. A small pledget of cotton on a match stick may be used for this purpose. The softened gelatin will thus make a seal when the two halves of the capsule are fitted together.

GRAININESS PREVENTED

When freshly prepared by the following formula the vanishing cream is smooth and rubs out well without lumping; however, on standing it becomes "grainy." What can you suggest?

Stearic acid	*130.0 Gm.*
Monohydrated sod. carbonate	*4.0 Gm.*
Glycerin	*30.0 cc.*
Pd. tragacanth	*4.0 Gm.*
Water	*750.0 cc.*
Perfume oil	*1.0 cc.*

—S. J. P., Maryland

Tragacanth is probably the offending substance, either because of inferior quality or incomplete dispersal through the ointment. The following procedure used in our laboratory produced a cream which developed only a slight granulation upon standing:

The tragacanth is first wet with the glycerin, then three-fourths of the water incorporated. The sodium carbonate is dissolved in the remainder of the water. Both aqueous solutions are then warmed to about 65° C. on water baths. The stearic acid is melted separately, and then the sodium carbonate solution added to it with brisk stirring. Next add tragacanth mixture and perfume as desired; agitate the resulting product until cooled to room temperature.

CREOSOTE GIVES TROUBLE

We have had difficulty filling the following prescriptions. Please outline the proper way of compounding them.

℞

Creosote Carbonate	*ƒ℥iii*
Syrup Cherry	*ƒ℥vi*
Syrup Tolu	*ƒ℥vi*
Syrup Sedatole, q. s.	*ƒ℥iii*

℞

Creosote Carbonate	*ƒ℥iii*
Syr. Cocillana Comp.	*ƒ℥iii*

—W. K., Texas

Trouble arises from the fact that creosote is insoluble in the water contained in the syrups. In both prescriptions a satisfactory preparation

can be obtained by first emulsifying the creosote carbonate with acacia before adding the other ingredients. The 4, 2, 1 rule can be adapted to this method, that is, using 4 parts of oil (as creosote carbonate), 2 parts water (as syrup) and 1 part powdered acacia. First place the acacia in a mortar, add the creosote carbonate and mix well. Then add the proper proportion of syrup all at once, triturating rapidly and lightly until a primary emulsion is formed. Then gradually add the remainder of the syrup with constant trituration.

In the first prescription, part of the *q. s.* syrup can be used for forming the primary emulsion, gradually incorporating the other syrups later.

ECZEMA OINTMENT FOR DOGS

Would you suggest a preparation that could be used for moist eczema in dogs?—R. R., Minnesota.

The *Pharmaceutical Recipe Book III* gives the following formula which is often prescribed for this disease:

Phenol	0.6 Gm.
Coal Tar	1 Gm.
Carbon Tetrachloride	2 cc.
Zinc Oxide	6.6 Gm.
Starch	6.6 Gm.
Ointment of Rose Water, *q. s.*	100 Gm.

Mix the phenol, coal tar and carbon tetrachloride, and incorporate the mixed powders and the ointment of rose water. Triturate until a uniform ointment results.

The veterinarian will usually direct that the ointment be applied two or three times a day.

CERESIN RECOMMENDED

A cream is being prepared by us which consists of lanolin and expressed almond oil. I want to harden it so it will not be too soft for use in summer but it must not contain wax. What do you recommend?—W. F., Missouri.

Use of a mineral wax, such as ceresin, will give a physical hardness with low melting point. Beeswax will give a salve-like consistency. It is not recommended that expressed almond oil be used since this material is a well-known allergen. We suggest that it be replaced with a heavy liquid petrolatum in like amount. If this is done, about 20% of ceresin will be needed at 64° C. to give the desired consistency. For a higher melting point, replace part of the liquid petrolatum with solid petrolatum, or increase the ceresin as necessary.

DUSTING POWDER FOR STOCK

Would you please supply a formula for a dusting powder for stock?—E. G., Virginia.

Research has demonstrated the effectiveness of Phenothiazine, N. F. against both sucking and chewing types of cattle lice. For the sucking types, the drug is diluted with an equal amount of white flour and dusted on the animals. If both sucking and chewing lice are present, the following formula had best be used:

Sodium fluosilicate	2 parts
Phenothiazine	1 part
White flour	1 part

In view of the limited supplies of rotenone and pyrethrin, the phenothiazine dusting mixture is of especial importance.

OINTMENT BASE SUGGESTED

Please suggest a suitable base for making an inexpensive sulfathiazole cream or ointment?—S. M. B., New York.

One of the best inexpensive ointment bases for carrying sulfathiazole is the Beeler Formula No. 8, as follows:

Cetyl alcohol*	15.0
White wax	1.0
Propylene glycol†	10.0
Sodium lauryl sulfate*	2.0
Water	72.0

* Available DuPont, Wilmington, Del. Sodium lauryl sulfate for cosmetics sold under trade name, Duponol C.

† Available Carbide and Carbon Chem. Corp., 30 East 42nd St., New York City.

Melt the cetyl alcohol and white wax in the propylene glycol on a water bath and heat to about 65° C. Dissolve the sodium lauryl sulfate in the water and heat on the water bath to about 65° C. Slowly add the oil phase to the well-stirred water phase and continue stirring on the water bath for about ten minutes. Remove from bath and continue stirring to the point of congealing.

PHARMACEUTICAL books reflect the new viewpoints and advances in a constantly changing profession. Here are listed some of the recent accessions to the library of the AMERICAN PHARMACEUTICAL ASSOCIATION. Among them are books for the retail pharmacist, the laboratory worker, the student. As another service to its readers, the PRACTICAL PHARMACY EDITION will supply additional information about books which interest you. If there is a book related to the practice of pharmacy which you are unable to obtain, THIS JOURNAL will send it to you postpaid upon receipt of check or money order covering the retail price.

NASAL MEDICATION—Noah D. Fabricant—*Williams and Wilkins*, 122 p., $2.50.

NEW AND NONOFFICIAL REMEDIES, 1943—Council on Pharmacy and Chemistry—*American Medical Association*, 772 p., $1.50.

THE APOTHECARY CHEMIST: CARL WILHELM SCHEELE—George Urdang—*American Institute of the History of Pharmacy*, 71 p., $1.25. A pictorial life history.

PHARMACY MANPOWER IN OHIO—James C. Yocum and Sam Arnold—*Bureau of Business Research, Ohio State University in coöperation with Ohio State Board of Pharmacy*, 89 p., $2.00.

SOCIAL INSURANCE AND ALLIED SERVICES, Report by Sir Wm. Beveridge (The Beveridge Report)—Sir William Beveridge—*Macmillan Company*, 299 p., $0.81.

MANUAL OF LABORATORY GLASS-BLOWING—R. H. Wright—*Chemical Publishing Company, Inc.*, 90 p., $2.50.

TEXT-BOOK OF INORGANIC PHARMACEUTICAL CHEMISTRY—Charles H. Rogers—*Lea and Febiger*, 704 p., $7.50.

SUBSTITUTES—H. Bennett—*Chemical Publishing Company, Inc.*, 225 p., $4.00.

URINE AND URINALYSIS—Louis Gershenfeld—*Lea and Febiger*, 304 p., $3.25.

DRUG STORE ACCOUNTING—J. Brooks Heckert and Wm. E. Dickerson—*McGraw-Hill Book Company, Inc.*, 409 p., $4.00.

SCOVILLE'S THE ART OF COMPOUNDING—Justin Lawrence Powers and Geo. E. Crossen—*P. Blakiston & Company, Inc.*, 457 p., $4.75.

UNITED STATES DISPENSATORY—Horatio C. Wood, Jr., Arthur Osol, Heber W. Youngken, Louis Gershenfeld—*J. B. Lippincott Co.*, 1900 p., $15.

PHARMACOGNOSY, 5th Edition—Heber W. Youngken—*P. Blakiston & Company, Inc.*, 1038 p., $7.50.

POSITION OF PHARMACY IN SICKNESS INSURANCE—George Urdang—*American Institute of the History of Pharmacy*, 24 p.

WHAT ARE THE VITAMINS?—Walter H. Eddy—*Reinhold Publishing Co.*, 247 p., $2.50.

PHARMACOLOGY OF THE OPIUM ALKALOIDS (2 parts), Supp. No. 165 to Public Health Reports—Hugo Krueger, Nathan B. Eddy and Margaret Sumwalt—*U. S. Public Health Service (Government Printing Office)*, 1448 p., $3.00.

HUNDRED YEARS OF MEDICINE—C. D. Haagensen and Wyndham E. B. Lloyd—*Sheridan House*, 444 p., $3.75.

THE INTERACTION OF DRUGS AND CELL CATALYSTS—Frederick Bernheim—*Burgess Publishing Company*, 85 p., $2.25.

DRUG AND COSMETICS REVIEW 1942–43—*Drug and Cosmetics Industry*, 392 p., $3.00.

CHEMISTRY OF INSECTICIDES AND FUNGICIDES—Donald E. H. Frear—*D. Van Nostrand Company, Inc.*, 300 p., $4.00.

PENICILLIN, Its Action and Uses.—*Merck & Co., Inc.*, 21 p., free on request.

BEHIND THE SULFA DRUGS—Iago Galdston—*D. Appleton-Century Company*, 174 p., $2.00.

USEFUL DRUGS, A Selected List of Essential Drugs with Brief Discussions of Actions, Uses and Dosage. Thirteenth Edition—*American Medical Association*, 306 p., $0.75.

DRUG PRODUCTS, LABELING, PACKAGING REGU-

LATION—Arthur Donald Herrick—*Revere Publishing Company*, 462 p., $6.00.

LILLY DIGEST OF THE 1941 STATEMENTS OF 404 RETAIL DRUG STORES—*Eli Lilly Company*, 37 p., free on request.

AN INTRODUCTION TO MATERIA MEDICA AND AND PHARMACOLOGY—Hugh Alister McGuigan and Elsie E. Krug—Third Edition—*C. V. Mosby*, 779 p., $3.50.

PRACTICAL EMULSIONS—*Chemical Publishing Company, Inc.*, 462 p., $5.00.

PHARMACEUTICAL PREPARATIONS—George A. Crossen and Karl J. Goldner—*The John S. Swift Company, Inc.*, 167 p.

VOLUMETRIC ANALYSIS—I. M. Kolthoff and V. A. Stenger—Vol. I, Second Edition—*Interscience Publishers, Inc.*, 309 p., $4.50.

AIDS TO THE ANALYSIS OF FOOD AND DRUGS—John Ralph Nicholls—*Bailliere, Tindall and Cox*, 424 p., $2.43.

CHEMICAL SOLUTIONS—Frank Welcher—*D. Van Nostrand Company, Inc.*, 404 p., $4.75.

FOOD AND DRUG REGULATION—Stephen Wilson —*American Council on Public Affairs*, 177 p., $3.25.

ACCOUNTING AND RECORD SYSTEM FOR THE RETAIL PHARMACY—*Eli Lilly and Company*, free to proprietors from company representatives. Provides simplified method of keeping store records.

DICTIONARY OF SCIENCE & TECHNOLOGY in English - French - German - Spanish—Maxim Newmark—*Philosophical Library, Inc.*, 386 p., $6.00.

DOCTOR IN THE MAKING, The Art of Being a Medical Student—Arthur W. Ham and M. D. Salter—*J. B. Lippincott*, 179 p., $2.00.

PLAIN WORDS ABOUT VENEREAL DISEASE—Thomas Parran and R. A. Vonderlehr—*Reynal & Hitchcock*, 226 p., $2.00.

DICTIONARY OF BIO-CHEMISTRY AND RELATED SUBJECTS—Wm. Marias Malisoff—*Philosophical Library*, 579 p., $7.50.

SHIPBOARD MEDICAL PRACTICE—W. L. Wheeler, Jr., M.D., *Cornell Maritime Press*, 114 p., $1. Handbook of ship sanitation and emergency medical aid for seamen with little or no medical knowledge.

HEALTH AND HYGIENE—Lloyd Ackerman—*The Jaques Cattell Press*, 895 p., $5. Comprehensive and well written discussions on disease prevention and health promotion.

CALAMINE LOTION APPLIED MORE UNIFORMLY

A method of improving the uniformity of successive applications of a lotion of calamine or neocalamine has been suggested to dermatologists for trial by Dr. Herman Goodman of New York (*Arch. Derm. Syphil.*, 48: 369, 1943). The powders settle slowly if at all when a neutral soap suspension of stearic acid and triethanol-amine is used as the vehicle. The following formula is suggested.

	Gm. or Cc.
Stearic acid	4
Triethanolamine	1
Water, *q. s.*	100
To which add:	
(*a*)	
Prepared calamine	8
Zinc oxide	8
or (*b*)	
Prepared neocalamine	15
or (*c*)	
Prepared neocalamine	8
Zinc oxide	4

Magma of bentonite, which is now included in the official lotions, serves a similar purpose of permitting uniformity of sampling. In the past, calamine lotion had an undesirable tendency to change with each application due to the powder sticking to the sides of the container.

Whether prepared calamine or prepared neocalamine is prescribed, the ingredient is zinc oxide, slightly and variously colored with some form of iron rust. Neocalamine is a closer color match to most white skins, Dr. Goodman points out, than is "the atrocious tint of calamine." It is suggested that those who wish to prescribe this lotion should request pharmacists to stock the ingredients and that experimentation be undertaken in the preparation of formulas and in the exacting study of color matching for individual patients.

Pharmacy's Role in Social Hygiene Program

PHARMACISTS AID CAMPAIGN AGAINST VENEREAL DISEASE, A. PH. A. PROMOTING PROGRAM

by WALTER CLARKE, M.D., Executive Director
AMERICAN SOCIAL HYGIENE ASSOCIATION

Although mechanical difficulties beyond the control of the editor have delayed the publication of Dr. Clarke's article on Social Hygiene Day, pharmacists will find much of lasting interest in this discussion of their role in the social hygiene program.

IN the light of past accomplishments in the field of public health education, pharmacists can, and undoubtedly will, make a major contribution to the success of National Social Hygiene Day. They are in a strategic position to bring authentic information to millions of persons concerning the cause, means of spread, and treatment of syphilis and gonorrhea.

The fight against the venereal diseases is an integral part of the war effort since these dangerous infections are a serious cause of lost man-days, particularly in the armed forces. It is well known that in the past, war has always brought an increase in venereal disease rates. Despite this fact, we are today in a good position to increase very rapidly the gains made in recent years against syphilis and gonorrhea.

The outlook for such a rapid advance in the campaign against venereal disease is doubly favorable because the war has brought a new determination to protect public health during these days of national crisis at precisely the time when new and improved methods are available for the treatment of these infections. We have come a long way since Ehrlich discovered the "magic bullet"—salvarsan.

The various methods of "rapid treatment" of syphilis which make use of new techniques, sometimes including fever therapy, while still not without danger, are new and valuable weapons in the control program. One of the greatest developments, which has been widely publicized, has come in the treatment of gonorrhea, in which, through the use of the sulfonamides, about 80% of all such cases can now be quickly cured.

Together with this progress has come a great increase in clinical and laboratory facilities. While five years ago there were only 1122 venereal disease clinics in the whole country, today the number has grown to more than 3500 clinics. In the same period there has been an increase in the number of blood tests for syphilis from 3,598,000 to 20,000,000.

We have, then, new and improved methods of treatment, greater clinical and laboratory facilities than ever before. A major job now is to make more and more people aware of the dangers of the disease, and the steps they must take, when necessary, to avail themselves of the proper treatment facilities.

The American Social Hygiene Association, acting in close teamwork with the Army, the Navy, the United States Public Health Service, and the Social Protection Division of the Office of Community War Services has conceived of itself as representing citizen interest in solving social hygiene problems through official action. One of its central purposes in doing this job is to bring the public the information it needs, in its own interests, concerning the venereal diseases.

The Association has always worked through a large number of national organizations such as the AMERICAN PHARMACEUTICAL ASSOCIATION, General Federation of Women's Clubs, the National Parent-Teacher Association and the United States Junior Chamber of Commerce. It is only

through such coöperation that a significantly large section of the population can be reached.

Many years of practical experience have proved that in this way real progress can be made in the nation's venereal disease control program. Experience has proved, too, that the program succeeds best on the local level when it has the support of the entire community.

This year the theme and slogan of Social Hygiene Day is—UNITE AGAINST VD—VD DELAYS VICTORY. Popular educational materials stress the need for the coöperation of the doctor, pharmacist, health officer, business man, labor leader, minister, parent, teacher—by every citizen acting not only individually but also through the organizations to which he belongs.

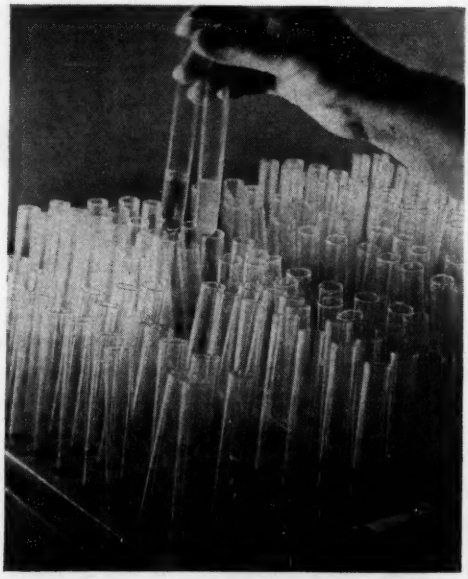
The members of the Joint Committee of the AMERICAN PHARMACEUTICAL ASSOCIATION and the American Social Hygiene Association, formed in 1940 to stimulate participation by pharmacists in the country's venereal disease control program, have expressed confidence that on February 2 pharmacists will do their share of this essential teamwork. This confidence is well justified by reports on the past year's achievements given at the joint committee's annual meeting held recently in Philadelphia.

At this time, it was reported, pharmacists distributed more than a quarter of a million leaflets, "A Tip from Your Pharmacist," and about 300 drug stores featured educational window displays on venereal diseases. In several cities, among them Philadelphia and Nashville, druggists took part in these ways in city-wide health campaigns.

An outstanding job of health education by pharmacists was done in Bridgeport where the city's Druggists' Association and the health department initiated a five weeks' social hygiene education campaign. Over 115 drug stores devoted space in their windows during this period to educational displays. Meetings, forums and radio programs were arranged, featuring speakers of national importance in the public health field.

State Program Planned

This response to this campaign was so great that the Connecticut State Pharmaceutical Association has decided to launch the program on a statewide basis. It has been reported by Louis E, Kazin, chairman of the Bridgeport Social Hygiene program, that preliminary conferences are now being held with the state health department.



U. S. Public Health Service Photo

SIGN OF ILL PORTENT, the cloudy Wassermann tube which usually indicates syphilis may no longer call for months of difficult treatment if present trials of combination chemical and artificial fever therapy show that the treatment can be widely used

A story on this campaign, first published in THIS JOURNAL, is being distributed in reprint form to more than 3000 sponsors of local Social Hygiene Day programs, to secretaries of state pharmaceutical associations, and to state and city health officers throughout the country.

Thus it is clear that pharmacists can play a key role in the country's public health program. There is no doubt that their coöperation will mean much to the effectiveness of this year's National Social Hygiene Day. The many community programs planned for this Day will reach the public through all available media, including meetings, radio talks, newspaper stories, film showings and wide distribution of popular educational material.

The venereal diseases are a serious wartime health problem. It requires an enormous effort by everyone to see that they are curbed. To help do this job is to make a substantial contribution to the winning of the war, and to guaranteeing that we will have a healthier, stronger, post-war America.

POISON IVY PREVENTIVES PROVE INEFFECTIVE

LACK of a suitable prophylactic to prevent or lessen poison ivy dermatitis is emphasized in a report (*Arch. Derm. Syphil.*, 48: 373, 1943) from Dr. J. B. Howell of Dallas, Texas, on a controlled study of proposed remedies.

Comparison of various prophylactic measures has heretofore been handicapped by variations in the degree of sensitivity of the subject and in the amount of sap encountered during clinical exposure. In the series of tests reported, a method was devised for approximating clinical exposure to the ivy shrub or vine. Fresh green leaves of the plant were crushed between the fingers of a nonsensitive physician and the oleoresin distributed as evenly as possible on each finger. Experimental exposure to poison ivy was then attained by a single light stroke on the skin of the volunteer subject with a contaminated finger.

Soap and Water.—After exposure to poison ivy by the "finger tests," the subjects washed contaminated areas vigorously with laundry soap and running water for five minutes as if preparing for a surgical operation in an effort to remove the oleoresin. When the contact time before washing was more than 10 minutes, the dermatitis which resulted was equal to that which occurred in unwashed areas. As Dr. Howell had evaluated the sensitivity of his subjects before starting the tests, he concludes that soap and water will not prevent or mitigate ivy dermatitis in an extremely sensitive person, even if the exposed area is washed after an interval of only one minute. For the person of average sensitivity, soap and water will lessen the severity of dermatitis only if it is used before the ivy oleoresin has completely dried, that is, within five or ten minutes after exposure.

Ferric Chloride.—Numerous tests using liberal applications of 10% solution of ferric chloride were made, applying the solution at intervals ranging upward from five minutes after contact. The dermatitis in the treated areas was in every case as severe as in the untreated control areas.

A 10% ferric chloride ointment applied before exposure gave no more protection than an inert substance in the same base. Dr. Howell concludes that any protection obtained from such a preparation is due to the mechanical covering offered by the base. The same ointment base containing 10% zinc oxide, 10% calamine or 10% talcum gave the same protection afforded by the 10% ferric chloride ointment.

Potassium Permanganate.—Of the prophylactic measures tested a freshly prepared 10% aqueous solution of potassium permanganate gave the best results. The severity of dermatitis was usually lessened if the solution was copiously applied during the first 15 minutes after exposure. For a highly sensitive person, the solution must be used within five or ten minutes to obtain similar results. The treatment is of no value if used more than 45 minutes after exposure, Dr. Howell's experiments show.

Sodium Perborate Ointment.—The use of freshly prepared 10% sodium perborate ointment, using bases 1 and 2 as advocated by Schwartz, Warren and Goldman, did not prevent ivy dermatitis in a single instance during approximately 100 different tests.

"Sodium perborate prophylactic ointment lessened the resulting reaction only very slightly," Dr. Howell reports, "compared with the dermatitis in the unprotected control areas."

The degree of protection which was given seemed to be in direct proportion to the thickness of the powdery film left after the water in the vanishing cream base had evaporated.

White Petrolatum.—Due to the solubility of the ivy oleoresin in oil, the use of petrolatum served to spread the dermatitis outside of the local areas of contact. Petrolatum not only failed to reduce the severity of the eruptions but resulted in involvement of surrounding areas.

1812 1944

March 15, 1944 Freshman classes will enter the four schools of the College on this date for accelerated professional education leading to B.Sc. degree in Pharmacy, Chemistry, Bacteriology or Biology completed in a little less than three years without sacrifice of normal academic standards. Complete courses, modern buildings, competent faculty, adequate facilities, offered by this, the oldest institution of its kind in the Americas. Write for catalog now.

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Pharmacy Advances Mark

PAST YEAR'S SCIENCE PROGRESS

PHARMACISTS of the future may look back on 1943 as the year when mass production of penicillin began in pharmaceutical laboratories, or when the establishment of the Army Pharmacy Corps helped to open new avenues of service for the profession. The 1943 attack on syphilis, converging from several directions, may have marked the beginning of the end for this ancient scourge. Use of the sulfonamides was extended during the year and new forms made the sulfas both more valuable and specific. Pharmaceutical products were given much of the credit for returning a high percentage of wounded U. S. fighters to duty after hospitalization—41% for the Army and 53% for the Navy and Marine Corps.

The important scientific achievements in fields of most interest to pharmacists are summarized on the following pages from reports compiled by Science Service. If you would like more information about any one item, send a request with two 3-cent stamps to help cover handling costs to THIS JOURNAL, 2215 Constitution Avenue, Washington 7, D. C.

MEDICINE AND PHARMACY

Hope of a penicillin conquest of venereal disease was held out by reports of cures of syphilis and gonorrhea by this safe, potent chemical from molds which has also been reported effective in treatment of gas gangrene, osteomyelitis and other staphylococcal infections, empyema, pneumococcus pneumonia and hemolytic streptococcal infections.

A new drug for fighting malaria which is sufficiently promising to be worthy of trial under field conditions was announced by the War Department, though the name of the drug was not released.

Continuous caudal analgesia, which banishes the pain of childbirth by means of continuous injection near the base of the spine of a pain-killing chemical, metycaine, was announced and said to give promise of further surgical usefulness for war wounded.

Possibility of using chicken serum to develop vaccines to protect against, or antiserums to cure, certain virus diseases, such as virus pneumonia, parrot fever, trachoma and lymphogranuloma venereum, was suggested by announcement of a chicken antiserum that definitely protected mice against a virus pneumonia.

Folic acid, one of the new B vitamins, was found to have an important role in blood cell production in studies showing it cured anemia and agranulocytosis induced by sulfonamides in white rats and that lack of it in the diet caused agranulocytosis in monkeys, anemia in chickens.

Thiamin, vitamin B_1, was discovered to be manufactured by the intestinal bacteria of humans, a finding likely to change earlier views of vitamin requirements.

Two 24-hour sulfa drug cures for impetigo were announced, one using sulfadiazine in a jelly that gives a plastic coating and needs no bandage, the other using microcrystalline sulfathiazole.

A method of creating nerve banks, constituting a supply of quick frozen and dried nerve fragments for nerve grafts, was developed and found successful in laboratory animals with clinical use as a future possibility.

The first clinical use of nerve grafts from cadavers with acacia used to glue the graft in place was reported with good results in the first two cases.

The production of safe vaccines against two types of encephalitis, or sleeping sickness, the St. Louis and Japanese B types—effective, according to blood tests, in half or more of the vaccinated—was announced.

A specially treated cotton, oxidized cellulose, which is safely absorbed by the body, was found to aid in stopping bleeding during operations on the brain or elsewhere when the material was soaked in blood-clotting thrombin, and gave promise of further medical and surgical usefulness.

The use of plasma, sulfa drugs and other drugs and the technique of quick evaucation of wounded to advanced surgical centers accounted for the return to active duty after hospitalization of 41% of United States Army war wounded, and 53% of Navy and Marine wounded.

The United States Army with the aid of vaccines won an almost 100% battle for its overseas troops in combating diseases, of which the typhus victory is especially noteworthy.

A second, more potent weapon against disease germs, penatin, was discovered in the same mold which yields penicillin.

Chemical methods were developed for taking salt out of sea water and making it drinkable.

Large-scale production of penicillin, germ-fighting chemical remedy from mold, was started, aided by development of two more productive strains of the mold and use of fermentation as well as surface culture methods of growth.

As a current make-shift method, the utilization of gauze saturated with culture medium in which the mold was growing permitted the application of penicillin to open wounds.

A major factor in causing sterile marriages and

stillbirths was traced to incompatibility of the parents with regard to a newly recognized blood factor, Rh, and a method of distinguishing couples who are doomed to childlessness from this cause from those who have a chance of having some normal babies was developed.

Sulfa Successes

New triumphs reported for sulfa drugs included: speedy recovery from shipyard eye (epidemic keratoconjunctivitis) by sulfathiazole desoxyephedrine treatment; controlling scarlet fever epidemics by sulfadiazine; and preventing epidemic diarrhea of the new-born and curing "babies' sore eyes" due to gonorrhea by succinyl-sulfathiazole.

A new sulfa drug, desoxyephedronium sulfathiazole, reported to bring prompt relief in colds and to shorten their duration, and the prevention of ear and sinus infections after a cold by a sulfadiazine spray were announced.

New sulfa drugs which were developed include: phthalylsulfathiazole, for treatment of intestinal infections such as dysentery and sulfamerazine, for pneumococcus pneumonia, meningitis, gonorrhea and streptococcus infections.

Two possible anti-influenza weapons suggested by tests on laboratory animals were inhalation of small concentrations of triethylene glycol vapor in air and by inhalation of a globulin fraction of influenza immune horse serum.

New methods of nerve repair and grafting, developed but so far used only in animals, were: use of an artery cuff to guide the blind growth of fibers from cut nerves in nerve splicing and use of a sliding sleeve extension made out of a stump of the severed nerve for the same purpose.

Repair of skull injuries by plates of tantalum, rare metal which is strong, light weight, easily malleable, does not corrode, is not poisonous and does not cause foreign body reaction, and use of tantalum wire for suturing nerves and tantalum foil wrappers to keep regenerating injured nerves free from scar tissue were reported.

Initial success of a new method of treating goiter by medicines instead of by surgical operation was announced using thiourea and thiouracil, which have the unique property of inhibiting the funcion of the thyroid gland, actually, it is believed, preventing production of its powerful hormone.

A method which simplifies treatment of diabetics and gives better control of blood sugar was developed by mixing two forms of insulin, slow-acting protamine zinc insulin and rapid-acting regular insulin.

Banishing toothache due to exposed dentin, common cause of dental pain, and desensitizing sensitive areas in the filling of cavities were reported to have been achieved by a new sodium fluoride treatment.

Red blood cells, formerly a waste by-product in the large-scale production of blood plasma, were salvaged and used successfully in place of whole blood in the treatment of anemia and, when dried and powdered, to hasten wound healing.

The right of the U. S. Food, Drug and Cosmetic Administration to set standards of identity for enriched food was upheld by decision of the U. S. Supreme Court.

Treatment of burns with a new plaster cast method, which stops pain, rests and protects the burned part from further injury, prevents swelling and slowing of the blood circulation in the burned area, showed good results in clinical cases.

Innovations developed for aiding in skin grafting included: refrigeration anesthesia of the area from which the skin is to be taken; use of a dye, sodium fluorescein, injected into a vein to indicate when the circulation has been established in the graft; and use of a chessboard pattern, sticky paper method to fix small bits of skin for grafting over a large area.

In the search for a morphine substitute without addiction property, relief of intractable pain in patients with inoperable cancer was obtained by three chemicals, known, for short, as M3, M4 and M7, developed following the lead of female sex hormone synthesis.

Successful methods for preventing and treating a serious war ailment of shipwreck victims, immersion foot, were developed by Royal Canadian Naval Medical Officers.

Presence of glutamine, essential for the growth of certain bacteria and also important in nitrogen metabolism of animals, was demonstrated in the blood and spinal fluid of man and other animals and a quantitative method for its determination in these body fluids was developed.

Discovery of a substance that specifically attacks the Islands of Langerhans and produces permanent experimental diabetes, was announced.

Patients with duodenal ulcer, as compared with normal individuals, were found to excrete in their urine smaller amounts of a substance that inhibits gastric secretion and may be important in the pathogenesis of the disease.

RED BLOOD CELLS, separated from plasma by centrifuging as shown in this Red Cross photograph, were formerly a waste product. They may now be salvaged and used to treat anemia and, when dried and powdered, used to promote wound healing.

Fish juices as a substitute for water for shipwrecked men in lifeboats were found to maintain life for protracted periods without danger to health.

A new acid treatment, racemic glutamic acid added to normal diet over long periods of time, was reported effective in warding off epileptic convulsions.

Prevention or cure of seasickness in three out of four cases by a drug developed by the Royal Canadian Navy was announced, though the formula is a military and naval secret at the present time.

Effectiveness of sulfa ointments, in treatment of skin infections and wounds was increased by adding to the base of the ointment ordinary water and a slightly alkalinized chemical.

Sulfathiazole was reported as a speedy cure for trench mouth and the sore throat that often accompanies it.

A method of extending the usefulness of sulfa drugs, consisting of interacting iodine with the sulfa drug, was discovered.

A chewing gum containing sulfadiazine was developed as a possible remedy for severe sore throats.

Possible substitutes or supplements for blood plasma in treating shock from hemorrhage suggested by laboratory tests on animals include solutions of amino acids and hydrolyzed proteins from either beef blood plasma or casein, the chief protein of milk, and beef blood plasma alkalized for a short time to destroy the antigens.

The injection of a special egg-nog directly into the intestines of patients undergoing abdominal operations was found by Russian military surgeons greatly to lessen shock and often to save life.

A new synthetic hormone, octofollin, was developed and used without ill effects to relieve menopausal distress.

A new chemical, diasone, was announced as a promising remedy for tuberculosis.

Structural details of the syphilis germ, treponema pallidum, were made visible for the first time by pictures taken with a new electron microscope, at an enlargement of 9000 diameters, and the resulting pictures then given an additional tenfold enlargement.

Faster recovery from infantile paralysis was reported to follow use of the drug, prostigmine, which relieves the excessive muscle tone or tension and the muscle spasm and also reduces incoördination in cases with not too severe involvement.

Discovery of a fear-and-worry chemical in the blood, as yet unidentified but believed responsible for physical changes resulting from emotional upsets, was announced.

Encouraging results in cases of advanced syphilis followed treatment by a new series of bismuth compounds, such as dihydroxypropyl bismuthate, which were taken by mouth instead of intramuscular injections.

Dicumarol was declared to be apparently effective in preventing postoperative thrombophlebitis and pulmonary embolism.

During the Tunisian campaign, certain evacuation hospitals returned 60% of the neuropsychiatric casualties to full combat duty within four days of admission; of these returned men, 89% performed effectively.

The incidence of pilonidal disease was believed to be increased in the armed forces because of the trauma occasioned by riding in jeeps and tanks.

Intravenous administration of fluorescein was used as a means of measuring arterial obstruction and efficiency of arterial blood flow in occlusive peripheral arterial disease.

Danger of injuring the brain by the fast treatment of syphilis with large doses of arsenicals may be decreased through use of chalcone, a chemical from lemon peel, experiments suggested.

Arsenical treatment for syphilis, amebic illness such as dysentary and trypanosome diseases like sleeping sickness, may be made safer by the use of a vitamin, para-aminobenzoic acid, it was reported.

Seven vitamers, sister vitamins, were discovered for biotin, believed by some to play an important role in cancer.

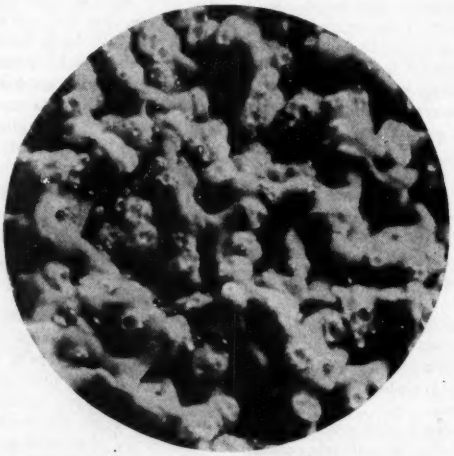
Diet was linked to malaria by the discovery that chickens and ducks deficient in the vitamin, biotin, developed a more severe type of malaria than did fowl on a normal diet.

Carrots were found to prevent ill effects of high altitudes in experiments on animals.

Incidence of two vitamin hunger diseases, beriberi and pellagra, was reported to have decreased through enrichment of white bread and flour with niacin and thiamin.

The practical utility of pine-needle tea as a source of vitamin C, the scurvy-preventer, was announced by Russian botanists.

A new, unidentified disease, bullis fever, thought to be transmitted to man through tick bites, was



PENICILLIN mass production methods were developed that should soon make the chemical one of our most widely used drugs. This magnified photograph of the velvety mold growth shows droplets of crude penicillin on the surface.

discovered and reported to be increasing in frequency and severity in the San Antonio area.

A new, speedy, low-cost pregnancy test, using rats instead of rabbits as test animals, was developed.

Recovery from severe burns is decisively influenced by the surrounding temperature during the first 24 hours, the most favorable temperature being about 75° F., laboratory tests with animals showed.

The danger of jaundice in persons who get human blood serum for transfusions or protective inoculations might be averted by ultraviolet irradiation of the blood or serum, experiments showed.

Treatment for shock in extensive burns, which in man is the cause of 60% to 80% of the deaths within the first few days, was reported successful in laboratory tests by use of a salt water drink.

BIOLOGICAL SCIENCES

About 200,000 quinine-bearing cinchona plants, grown from seeds rescued from the Philippines during invasion, were sent to neighbor republics for planting.

Fresh evidence that virus disease particles are giant protein molecules capable of reproduction and parasitic feeding within living cells was obtained by means of the ultracentrifuge, which whirls solutions at high speeds and separates and sorts the particles.

Science Service Photo.

CORK for use in prescription laboratories of the future may come from native bark, such as that being stripped from a tree in California. A program for growing cork oaks in the United States is now under way.

A strain of mold was induced by X-ray to undergo genetic changes from which were established many pure lines specifically deficient in ability to synthesize dietary essentials; these strains offer new approaches to the study of biochemistry and genetics and have also proved extremely valuable in delicate chemical analysis of food.

Plant tumor bacteria, when deprived of power to cause abnormal growths through use of glycine, regained it when treated with hormones; bacteria from the tumors thus caused were unable to produce new tumors unless again aided by hormones.

A deadly poison, actinomycin, extracted from a microbe in the soil, was discovered as a possible rodent exterminator when laboratory tests revealed it not as a germ killer for mice, but a killer of the mice instead.

A method for cutting muscle slices only $^{1}/_{100,000}$ of an inch thick was devised to give the electron microscope a view of hitherto invisible structures involved in nerve-muscle action.

Large-scale use was made of an enzyme formed in mass-cultured mold for the splitting of starch into sugar for fermentation into industrial alcohol.

Special strains of yeast were developed, having nutritious qualities and flavors of meats and other foods.

A new synthesized female sex hormone was developed by combining sulfur with the natural female hormone, estrone.

Prenatal control of sex of fruitflies was accomplished by genetic selection.

Pellets of synthetic female sex hormone, diethylstilbestrol, inserted under the skin of young roosters, made them resemble hens.

Successful domestication of a number of useful native grasses, never previously cultivated, to control erosion, improve range lands and provide more livestock food, was reported.

A program to promote the increased growing of cork-oaks in this country to eliminate the future risk of being cut off from foreign supplies was announced.

The need for boron in fertilizers to increase plant growth was found to vary according to the type of soil and concentration of calcium and potassium in the soil.

The first natural epidemic on record of vesicular stomatitis among hogs was discovered.

Probably for the first time in history, two brains in one dog were discovered in a routine rabies examination.

CHEMISTRY AND PHYSICS

Biotin, recently dicovered vitamin of the B group, was made synthetically, thus affording more ample supplies for research in human nutrition.

A new method of preserving vitamin C in evaporated milk by sealing the evaporated milk tins in an atmosphere of nitrogen or under vacuum was developed which increases by 50% the vitamin C retained after six months' storage.

Riboflavin (vitamin B_2), important in the prevention of certain eye and skin diseases, was found to be present in the soil and in a yeast first isolated from sour milk.

Two important vitamins, riboflavin and thiamin, were recovered in quantity from brewery wastes by the use of an insoluble synthetic resin, Amberlite IR-100.

An inexpensive process for recovering a billion pounds of food protein annually from wheat used for alcohol production was developed.

A process for obtaining large quantities of protein for possible human consumption from a "de-fatted" corn germ was developed.

A concentrated protein extract to be used as a substitute for scarce grain in livestock rations was obtained by chemical treatment of grass.

A method for quicker and cheaper removal of proteins from distillery wastes by use of bentonite was developed, thus affording valuable protein cattle food.

A sticky starch, used as a substitute for tapioca and for textile sizing and finishing and for paper coatings was made from certain kinds of corn and sorghum.

Wheat gluten, a by-product in the manufacture of wheat starch, was found to make a good adhesive when dissolved in dilute ammonia.

Potatoes, when mashed and kept hot for a period before serving, were found to lose vitamin C rapidly.

Hand-size aerosol dispensers, containing highly compressed Freon gas, a very concentrated pyrethrum extract and some sesame oil, were introduced for protection of the Army from malaria mosquitoes overseas.

Sabadilla, seed insecticide, was processed as a spray for extermination of household and crop insects as a substitute for Japanese controlled pyrethrum.

A simple, inexpensive method of keeping whole milk powder fresh twice as long through the addition of wheat germ oil and edible acids was developed.

A process for obtaining carbohydrates from sweet potatoes for new sugar products was developed by removing water from potatoes at a high temperature and humidity.

Foods dried in a natural gas atmosphere, which is

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later burned to heat the dehydration unit, retained almost all their vitamin C and original color and taste.

The mechanism by which auxins, hormone-like substances, stimulate plant growth was discovered to be by the release of an enzyme, diastase, from protein colloidal substances.

A new and more economical alcohol process for the recovery of glycerin from fats in soap making was developed.

A new kind of synthetic rubber, Paracon, was developed which will be valuable as a special replacement for natural rubber, particularly in the aircraft industry.

The extent to which the molecules of substances form crystals was found to determine the difference between springy rubber, a hard plastic and a tough fiber.

An improved vinyl-type plastic, Marvinol, to replace rubber for such uses as inner tubes, surgical gloves and molded goods was made from coal, air, salt and water.

Starch acetate, a new plastic chemical for use as a lacquer and water-resistant adhesive, was made from potatoes.

A water-repellent, invisible film, which prevents water from soaking into such objects as radio insulators, was developed by treating the objects with methyl chlor silanes vapors.

A new, more economic fluorescent material, composed of zinc oxide and vanadium pentoxide, was developed which transforms invisible ultraviolet rays into warm yellow visible light.

New war gases, nitrogen mustards, were developed and found to have a milder blistering action than mustard gas and to cause blindness.

Million-Volt X-rays

For the first time, 100,000,000-volt X-rays, fifty times greater than any previous voltage, were produced.

Radar, a locator using ultra-high frequency radio waves, although developed earlier, was announced.

The smallest "quantum" of energy, the amount that would be emitted by a single atom making one vibration per second, if that were possible, has been somewhat enlarged by new measurements made by X-rays and agrees satisfactorily with results calculated from the atomic theory.

By shooting invisible infrared rays through certain organic chemicals, such as fuels and rubber compounds, it was found that high-speed analysis, impurity tests and molecular determinations could be made.

"Heatronic molding," or the heating of plastic objects all the way through at the same time by means of high-frequency radio waves, was made practical for the speedy production of airplane instrument panels, radio housings and other thermosetting plastic objects.

A speedy, improved method for observing the rate at which metals diffuse through one another to form alloys was developed by heating thin metal

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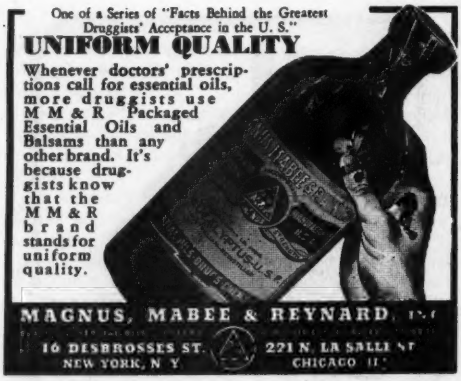
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films and measuring the amount of light reflected from the film.

A new phosphorescence microscope for the examination of objects by their own short-lived glow after ultraviolet irradiation was devised.

Rhenium, rare chemical element, formerly a German monopoly since its discovery in 1925, was found in dust from the flues of molybdenum ore-roasting plants in a western state.

A huge optical glass disk, the largest prism ever made, measuring 26 inches in diameter, graduated in thickness from one and one-half inches to three and one-quarter inches and weighing 260 pounds, was successfully cast for use in an astronomical telescope.

WITH A. PH. A. BRANCHES

ORGANIZATION of a new student branch at the University of Buffalo School of Pharmacy has been completed and the first meeting was held in December. Dr. Harry LaForge addressed the group on the Wagner bill, and James Hill of Niagara Falls spoke on aspects of professional pharmacy. Pharmacists who had been members of the former local branch were invited to attend the inaugural session.

In Philadelphia the principal event at the December meeting of the local branch was a discussion of penicillin by Dr. Charles Church of the Medical Department of E. R. Squibb and Sons. Clinical charts of individuals with type III pneumonia, osteomyelitis and staphylococcus infections, who had been treated with the drug, showed its powerful chemotherapeutic action. Dr. Church's address was heard by more than 200 persons.

The January program of the New York branch was also devoted to the germ-fighting chemical from mold. Dr. Walton J. Smith of the Charles Pfizer research department discussed "Some Chemical Aspects of Penicillin." The clinical aspects were covered in an address by Dr. Harry J. Greene of the Kings County and Jewish Hospitals of Brooklyn.

At the St. John's University College of Pharmacy, student branch members recently saw a motion picture on the sex hormones and their therapeutic applications. Arthur Emelin of Parke, Davis and Company gave an accompanying talk and later answered the members' questions.

PRODUCER OF CRUDE PENICILLIN GAUZE WARNED OF DANGERS

A warning against certain dangers in "homemade" penicillin has been issued by Drs. Kenneth B. Raper and Robert D. Coghill, U. S. Department of Agriculture microbiologists (*Jour. Am. Med. Assoc.*, Dec. 25). Efforts to produce penicillin for topical use in small laboratories (*see* THIS JOURNAL, Nov.) "may constitute noteworthy contributions to the field of penicillin therapy," they state, adding that they do not want to lessen in any way the possible importance of this type of work.

Selection of the mold is the first pitfall that may be encountered. *Penicillium notatum* is only one of scores of blue-green molds that grow on bread, cheese or other foods. Distinguishing the right mold can be done only by "painstaking laboratory cultivation and microscopic examination."

To assure that satisfactory cultures will be available, the scientists have deposited two of the strains of *Penicillium notatum* widely used for industrial production with the American Type Culture Collection at 3900 Reservoir Road, Washington, D. C. These are available to producers of penicillin gauze at a nominal charge.

Even if the small laboratory producer starts with a good strain of mold, every precaution must be taken to avoid contamination with molds that may produce chemicals dangerous to man. Each penicillin dressing should be microscopically checked for purity before application.

Another pitfall in the use of the crude penicillin is that it contains protein material to which the patient may become sensitized. This may result in severe illness, the scientists warn, particularly if protein-containing penicillin is put on an extensive burned area.